

SilvaClean® Residual Antimicrobial Laundry Additive

Laundry Process and Facilities Frequently Asked Questions

Q. What is SilvaClean® and how does it work?

A. SilvaClean is a smart patented technology platform that is installed at the laundry facility. It infuses textiles with silver ions during the laundry rinse cycle, where they bond the fabric to residually kill pathogens, mold and mildew, reducing odors and static. SilvaClean chemistry is EPA-approved as a laundry additive with residual activity against post-laundry contamination. The SilvaClean system is a dispensing device enabled by the Internet of Things (IoT) that doses the EPA-approved SilvaClean chemistry onto textiles, leaving fabrics with residual antimicrobial properties even after laundering (e.g. in storage, during handling and in use). When linens are being used, SilvaClean remaining in the linens will reduce levels of *Staphylococcus aureus* and *Candida albicans* by 99.9% after 6 hours of contact; *Klebsiella pneumoniae*, Vancomycin-resistant *Enterococcus faecalis*, Extended-spectrum positive *Escherichia coli* and *Acinetobacter baumannii* by 99.9% after 3 hours of contact; and Methicillin-resistant *S. aureus* by 99.9% after 9 hours of contact. As part of a diligent infection control program, experts recommend that a hospital and sports infection control program should seek to reduce or eliminate exposure to pathogens to the greatest extent possible. One practical, inexpensive way to aid in this effort is to use SilvaClean laundry additive.

Q. What is the SilvaClean system?

A. The SilvaClean system gets installed at the laundry facility to deliver SilvaClean laundry additive to the laundry machine. The SilvaClean system consists of:

- **Cartridge:** Contains the EPA-approved SilvaClean chemistry solution. Each cartridge can treat approximately 200,000 pounds of textiles.
- **Dispensing device (SC4700):** Delivers SilvaClean chemistry to the washer (during the laundry rinse cycle) when connected to the laundry machine.
- **Remote cloud monitoring:** Controls the system, collects data remotely, and sends alerts to the Applied Silver technical support team to ensure overall quality control of the process. Data collected through this monitoring are compiled as monthly QC reports.



1. Cartridge
SilvaClean cartridge is inserted into dispensing device

2. Dispensing Device
Communicates w/ washing machine to deliver SilvaClean

3. Cloud Connectivity
Controls SilvaClean dosing and collects QC data

SilvaClean® Laundry Process and Facilities Frequently Asked Questions

Q. What textiles can be treated with SilvaClean?

A. SilvaClean can be used to treat a variety of fabrics. SilvaClean is EPA-registered for reduction of post-laundry contamination with textiles made of cotton/polyester blend, and microfiber (Examples include: pillow covers, sheets, blankets, bedspreads, apparel, uniforms, mops, cloths and towels). In addition, SilvaClean can also be used for material preservation of textiles made of cotton, cotton/polyester blend, polyester, nylon, microfiber, spandex and nylon/spandex blend (Examples include: pillow covers, sheets, blankets, bedspreads, apparel, uniforms, jerseys, active wear, scrubs, lab coats, quilts, liners, curtains, draperies, upholstery, towels, shower curtains and carpets). See SilvaClean EPA label for details.

Q. What are the site requirements for installing the SilvaClean system at a laundry plant?

A. SilvaClean system installation requires four things:

1. Dedicated water supply (continuous pressure above 20 psi is recommended)
2. Dedicated power supply at 120 volts and below 15 amps
3. Ethernet connection
4. Access to a drain

Applied Silver can provide a deionized water filtration system as part of the installation when an existing system is not available to supply water to the SC4700 dispensing device.

Q. How long does it take to install the SilvaClean system?

A. The SilvaClean system can be installed and operational at the laundry facility within four-six weeks of receipt of a purchase order. A typical installation consists of the following steps:

1. Site survey: A preliminary questionnaire to gather site information.
2. Onsite visit (1 day): To gather additional information, scope the site and meet with the site engineer/manager and chemicals provider.
3. Installation visit (4 days): To physically install the system including:
 - a. Plumbing, mechanical, and electronic integration into tunnel washer, incorporation of SilvaClean chemistry recipes into tunnel recipe list
 - b. Line verification and qualification
 - c. Training of site personnel on how to handle and store SilvaClean cartridges.

These steps require Applied Silver technical support staff to work directly with site engineers and other relevant personnel to ensure a successful integration of the SilvaClean system into your laundry process.

Q. How much space is required to install the SC4700 SilvaClean dispensing unit?

A. The SC4700 unit is 27" by 14.5" by 52". Applied Silver recommends a 9-square feet footprint to allow enough space for the doors to open. If the facility already has a deionized water filtration system, an additional installation is not required. When required, an additional 72" by 18" footprint will be needed. This additional space does not need to be directly next to the SC4700.

Q. Is the SilvaClean system fully automated?

A. Once installed and qualified, the SilvaClean system is fully automated. It only requires the replacement of the SilvaClean cartridge when it runs out (approximately every 200,000 pounds of treated textiles).

SilvaClean® Laundry Process and Facilities Frequently Asked Questions

- Q. How will installing the SilvaClean system impact the existing laundry process at the facility?**
A. Once installed, the SilvaClean system is specifically designed to have minimal impact to your current laundry process. After the new, SilvaClean recipes or formulas have been programmed into the washing machine, initiation to treatment simply requires selection of the right recipe, with the rest of the workflow remaining the same. Applied Silver technical support staff will provide best practices and training to the appropriate laundry staff before the system is in routine use. If the laundry requires segregation of SilvaClean -treated textiles from untreated textiles as part of the workflow, Applied Silver technical support can provide consultation and share best practices.
- Q. Can SilvaClean treatment be turned on and off as needed?**
A. SilvaClean treatment is programmed with specific wash formulas. The treatment can be easily turned on or off using the enable/disable switch. This allows laundries to turn the service on for clients that request SilvaClean treatment of their textiles.
- Q. When should the SilvaClean cartridge be replaced?**
A. The SilvaClean cartridge is to be replaced approximately every 200,000 pounds of laundry treated. The remote alert light and the SC4700 status indicator light will notify the laundry staff when the cartridge is low and ready to be replaced as well as when it is empty.
- Q. Does SilvaClean treatment replace existing laundry process?**
A. SilvaClean treatment augments existing laundry processes to provide a new level of textile care for patients and clinicians. Textiles now have active, residual antimicrobial properties, effective anytime a microbe touches the textile post-laundering: in storage, during handling and in use.
- Q. Will the silver in SilvaClean chemistry interact with other laundry chemicals?**
A. Since SilvaClean chemistry is only added in the final rinse of the laundry process, it minimally interacts with other laundry chemicals. It is fully compatible with currently laundry processes and chemistries including detergents, sours, softeners, etc.
- Q. Does water quality impact SilvaClean treatment?**
A. SilvaClean works optimally in industrial water (i.e. softened water), and also works efficiently with varying water profiles.
- Q. In a counter flow tunnel washer, does SilvaClean chemistry travel with the water cycle back to the front?**
A. Because SilvaClean's silver ions are highly efficient in attaching to textiles through a +/- charge interaction, negligible amount of silver will be in the effluent to move through the tunnel with re-used wash water.
- Q. Does SilvaClean react with the washer equipment?**
A. SilvaClean does not react with the washer equipment.

SilvaClean® Laundry Process and Facilities Frequently Asked Questions

Q. What about silver discharge?

A. The SilvaClean product is registered for use as a residual laundry additive by the Federal EPA and the California Department of Pesticide Registration for industrial use. SilvaClean has been intensively tested for concentration of silver in effluents as part of that approval process. Any residual silver ions in the wastewater are at levels significantly below the EPA's and the city Publicly Owned Treatment Works (POTW) requirements.

Q. How does SilvaClean attach to the textiles?

A. SilvaClean's silver ions attach to the fabric through a charge-based interaction. Once attached, the silver ions provide a residual antimicrobial effect throughout the linen use cycle.

Q. Does SilvaClean treatment change the way fabrics looks, feels, smells, etc.?

A. No. SilvaClean treatment does not change the way the fabric looks or feels. Silver ions are much smaller than the eye can see and cannot be seen on textiles and do not result in any discoloration of the treated textile.

Q. Are there any OSHA implications for SilvaClean product use? Is the product safe to use?

A. SilvaClean handling practices are simple and comparable to other laundry chemicals used in the existing industrial process. In fact, SilvaClean concentrate falls into the same category as most concentrated laundry soaps, sharing the same hazmat packaging group (II), corrosive rating (II), and UN identification number (1760). Employees handling SilvaClean should consult the cartridge label for safety information and handling instructions. Site personnel will be trained to handle SilvaClean cartridges as part of the basic training given by the ASI technical support staff. SilvaClean uses silver ions. At the concentrations used in the product, it is a potent antimicrobial and does not impact mammalian cells, including human cells. It is safe to use and is approved by the EPA to be used for industrial use including use in all hospitals including neonatal, pediatric, PICUs etc. SilvaClean has been in use at multiple hospital and sports facilities for the last several years.

Q. How is SilvaClean product registered and/or approved for use by the government?

A. SilvaClean is an antimicrobial laundry additive that reduces post-laundry contamination. SilvaClean product registration falls under the regulatory authority of the Environmental Protection Agency (EPA), specifically, the Antimicrobials Division (7510P) under the Office of Pesticide Programs (OPP). EPA regulates pesticides under the statutory authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which defines an Antimicrobial pesticide as that which is intended to disinfect, sanitize, reduce, or mitigate growth of development of microorganisms; or protect inanimate objects from contamination caused by microorganisms.

Q. Is SilvaClean registered with the EPA for public health uses?

A. Yes. Under the product registration "Laundry additive to reduce post-laundry contamination", the EPA has approved SilvaClean for public health uses. SilvaClean can be recommended as a useful addition to aid Infection Control at hospitals and sports programs. When linens are being used, SilvaClean remaining in the linens will reduce levels of *Staphylococcus aureus* and *Candida albicans* by 99.9% after 6 hours of contact; *Klebsiella pneumoniae*, Vancomycin-resistant *Enterococcus faecalis*, Extended-spectrum positive *Escherichia coli* and *Acinetobacter baumannii* by 99.9% after 3 hours of contact; and Methicillin-resistant *S. aureus* by 99.9% after 9 hours of contact.

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- Q. Is SilvaClean registered with the EPA for non-public health uses?**
A. Yes. Under the product registration “treated article exemption”, the EPA has approved SilvaClean for use in protection of treated textiles from stain- and odor- causing bacteria mold and mildew.
- Q. What is the difference between SilvaClean technology and other Bactericides and Fungicides?**
A. Unlike chlorine, quaternary ammonium compounds (quats.) and peroxide additives, the SilvaClean, when treated onto fabrics, is effective when the fabrics are used. When linens are being used, SilvaClean® remaining in linens will reduce levels of *S. aureus* and *C. albicans* by 99.9% after 6 hours of contact; *K. pneumoniae*, Vancomycin resistant *Enterococcus faecalis*, Extended-spectrum beta-lactamase positive *E. coli*, and *A. baumannii* by 99.9% after 3 hours of contact; and Methicillin-Resistant *S. aureus* by 99.9% after 9 hours of contact.
- Q. How can SilvaClean treatment of textiles be verified?**
A. SilvaClean treatment of textiles can be easily verified using a simple colorimetric SilvaSure® test kit for routine quality control at the laundry site. The Applied Silver technical team can also send samples out for a higher precision analytical testing (destructive test) when required, using a third party laboratory
- Q. What is the SilvaSure® kit?**
A. The SilvaSure kit is a simple colorimetric test to confirm presence of silver ions on linens following SilvaClean treatment. The test can be used for quality control of process and requires minimum training to use.
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 +  = Treated

 +  = Not Treated

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Q. What are the potential environmental impacts of SilvaClean treatment?

A. SilvaClean is registered for use as a residual laundry additive by the Federal EPA. SilvaClean has been intensively tested for concentration of silver in effluents as part of that approval process.

Q. How do treated sheets benefit laundry employees?

A. In addition to being a value-add to hospital infection control programs, SilvaClean also provides a significant benefit to the laundry employee experience. SilvaClean treated linens are continuously killing microbes that can otherwise contaminate them during the linen use cycle, including during use. As a result, the linens stay cleaner and return to the laundry cleaner thus reducing employee exposure to microbes coming from client facilities.